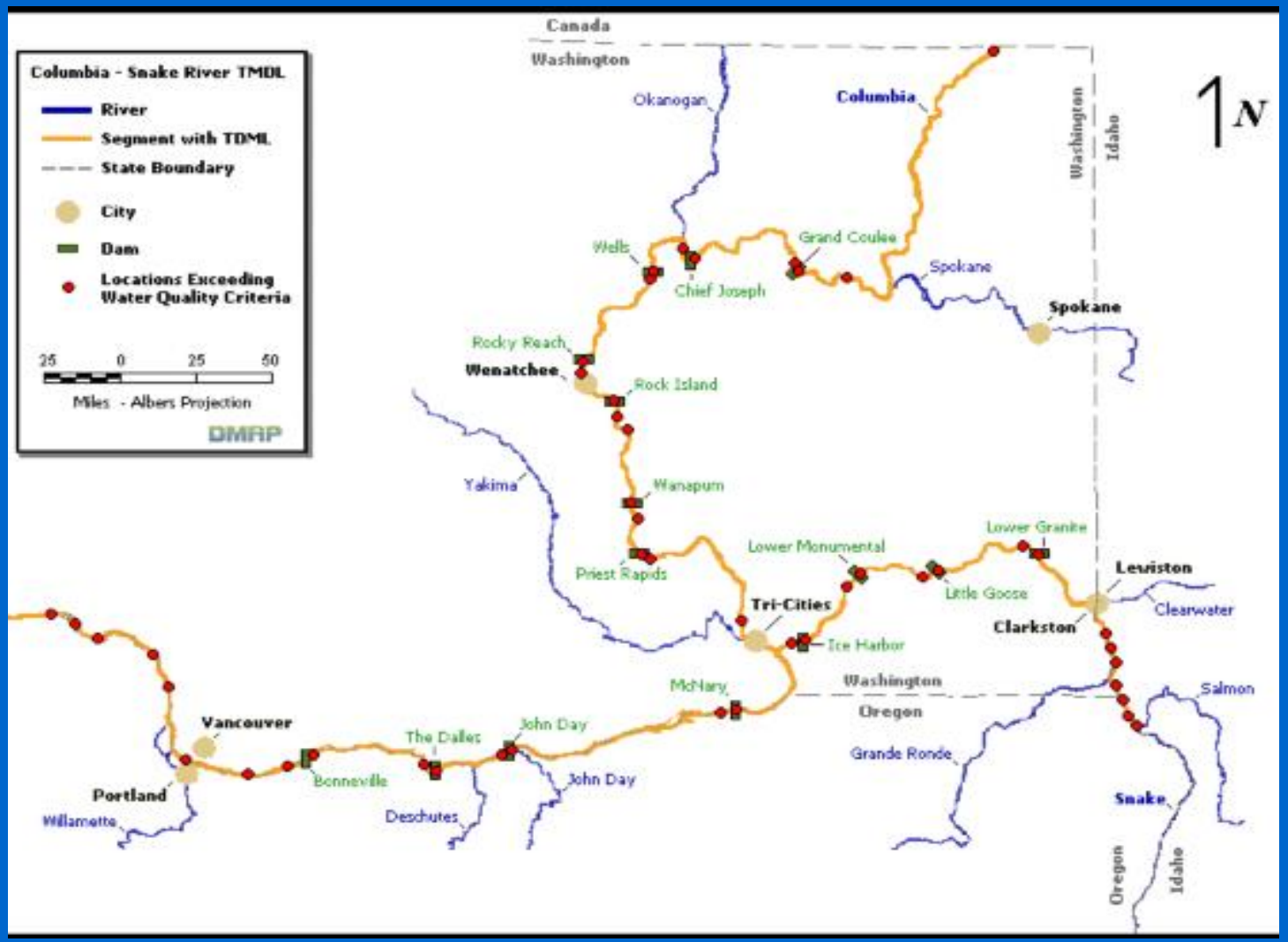
Columbia/Snake Rivers

Temperature TMDL

U.S. EPA Region 10

Geographic Scope



Important Term

Site Potential Temperature (SP):

Temperature that would occur in the main stems if the effects of human activity on temperature within the main stems in the TMDL Project Area are eliminated.

Summary of Temperature Goals

- At Columbia River Mile 4:

- 0.14 ^{o}C over Site Potential Temperature (SP) if SP exceeds 20 ^{o}C;

- 1.1 ^{o}C over SP if SP is less than 20 ^{o}C.

Summary of Temperature Goals

- Where Salmonid Spawning Occurs along the Oregon/Washington Border:

- 0.14 ^{o}C over SP if SP exceeds 12.8 ^{o}C between October 1 and May 31;
  - The TMDL establishes that salmonid spawning occurs upstream of RM 112 (I 205 bridge).

Effects on River Users

- Dams are allowed essentially no increase over site potential:
- Point Sources with individual permits are generally allowed their existing discharges.
- Point sources with general permits are allowed their existing discharges.

Effects on River Users

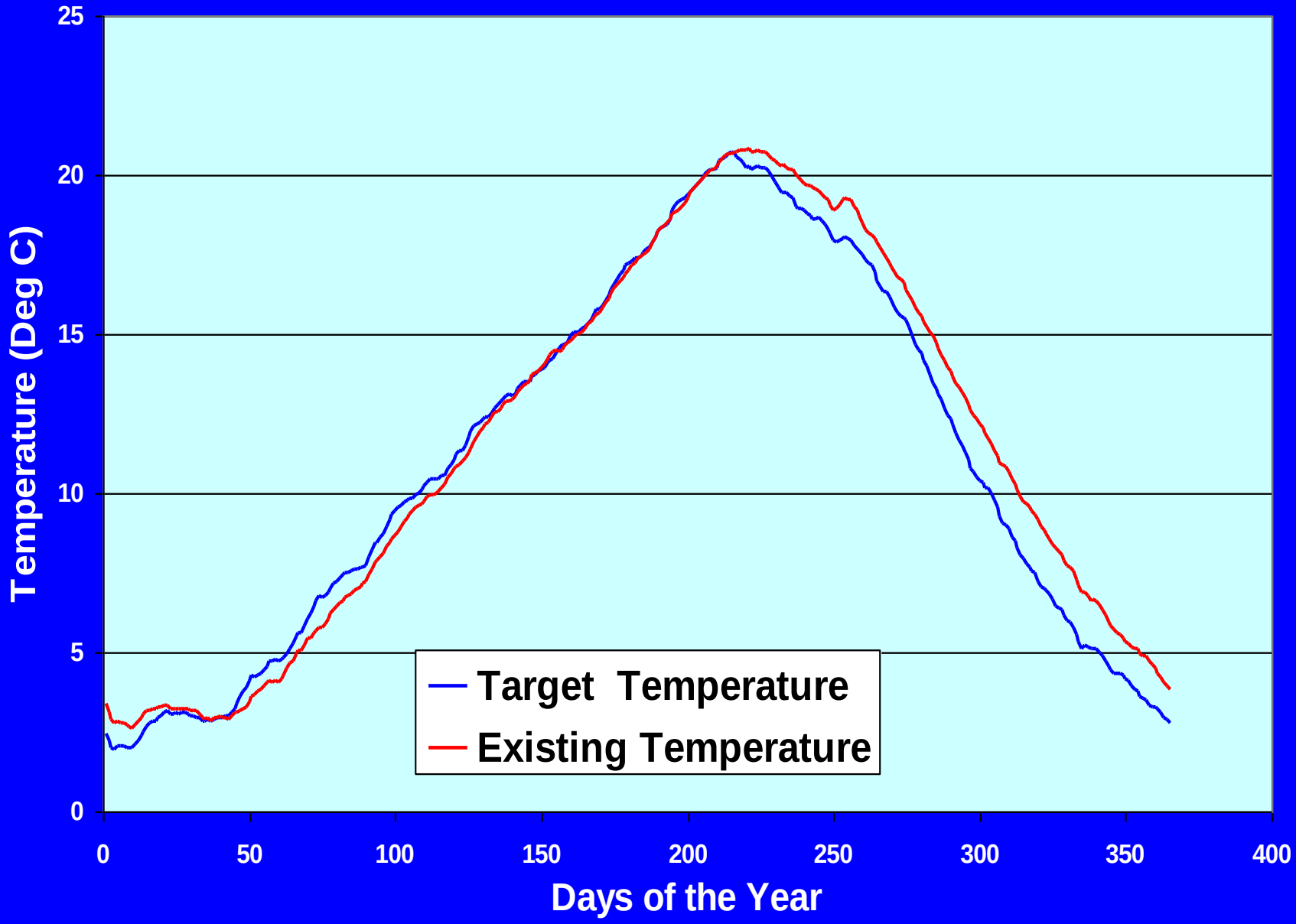
- Some future growth is allowed via the group allocations.

- NPS will be addressed in the individual tributary TMDLs as they are developed.

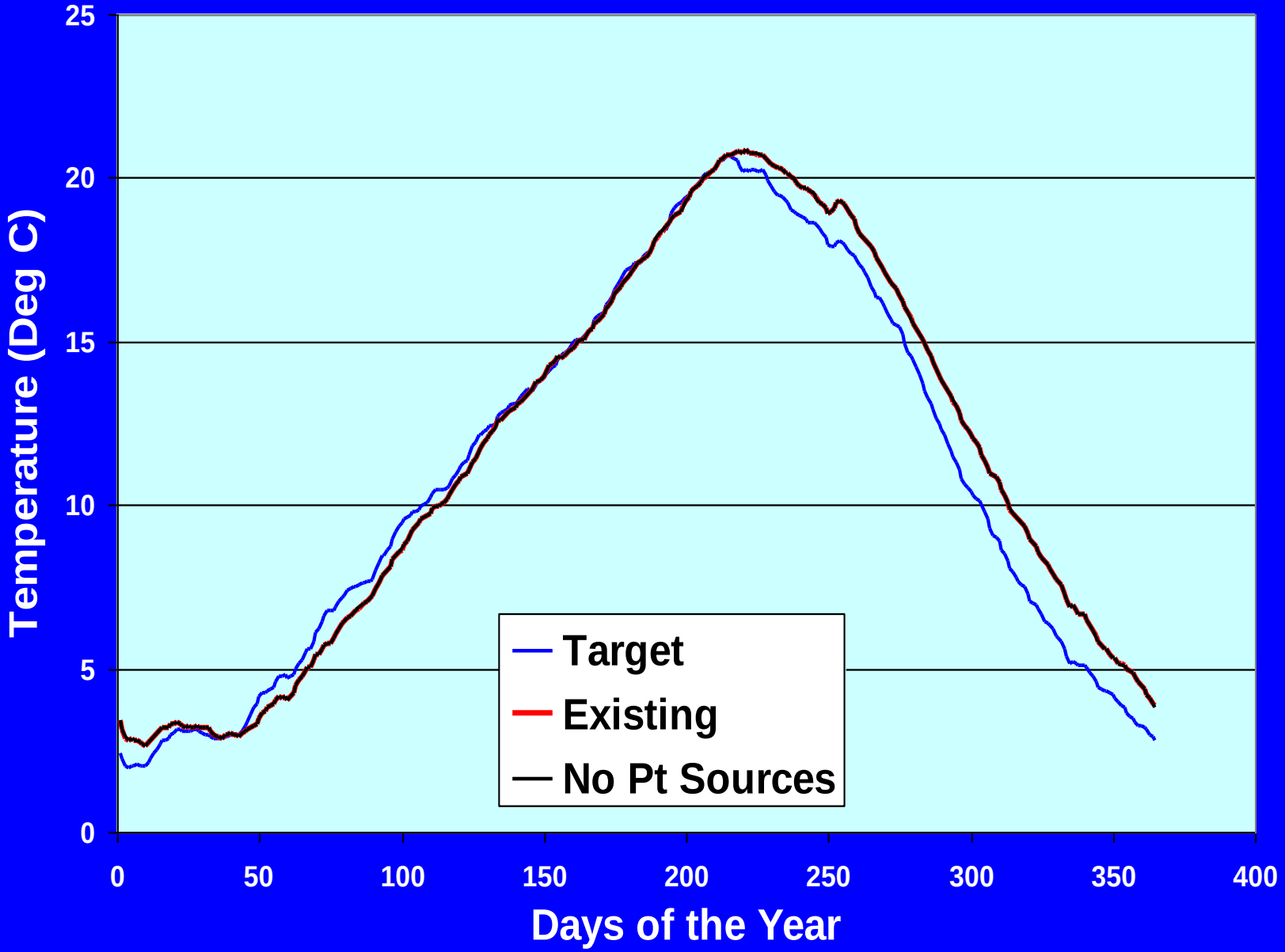
Dams VS Point Sources

- Why no allocation for dams and full allocations for point sources?
  - Dams have much greater impacts on temperature than the point sources;
  - Limiting the point sources would not benefit the dams.

Simulated Mean Temperatures at Columbia River Mile 42



Simulated Mean Temperatures at Columbia River Mile 42



Potential Effect of this TMDL on Dams

- Varies with the effect of the dams on temperature.
- Three fairly distinct groups of dams.

Potential Effect of this TMDL on Dams

Dams that clearly increase temperature by more than a degree Centigrade:

Grand Coulee	John Day
Lower Granite	Little Goose
Lower Monumental	Ice Harbor

Potential Effect of this TMDL on Dams

Dams with highly variable impacts up to a degree Centigrade:

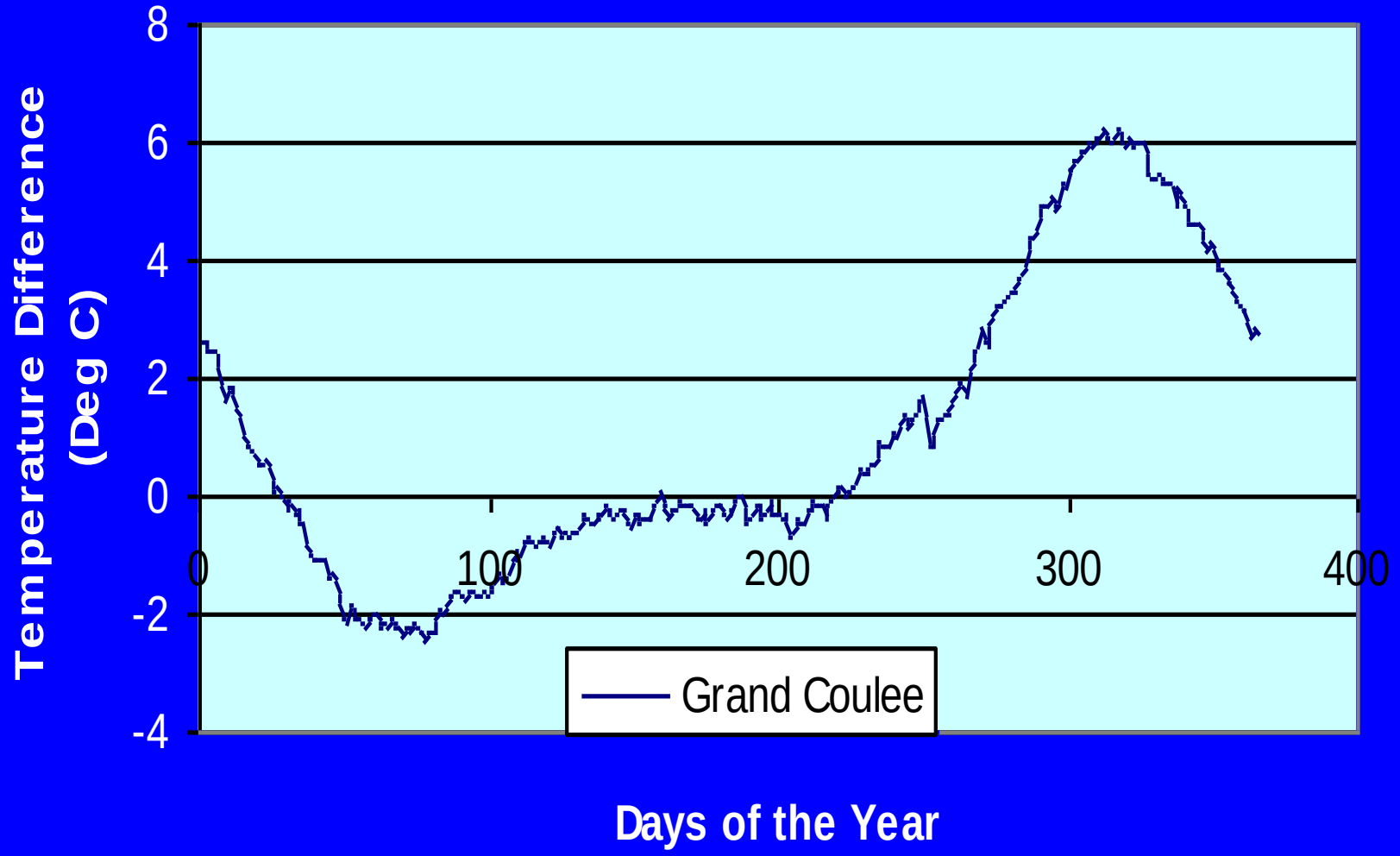
Chief Joseph Wanapum

Potential Effect of this TMDL on Dams

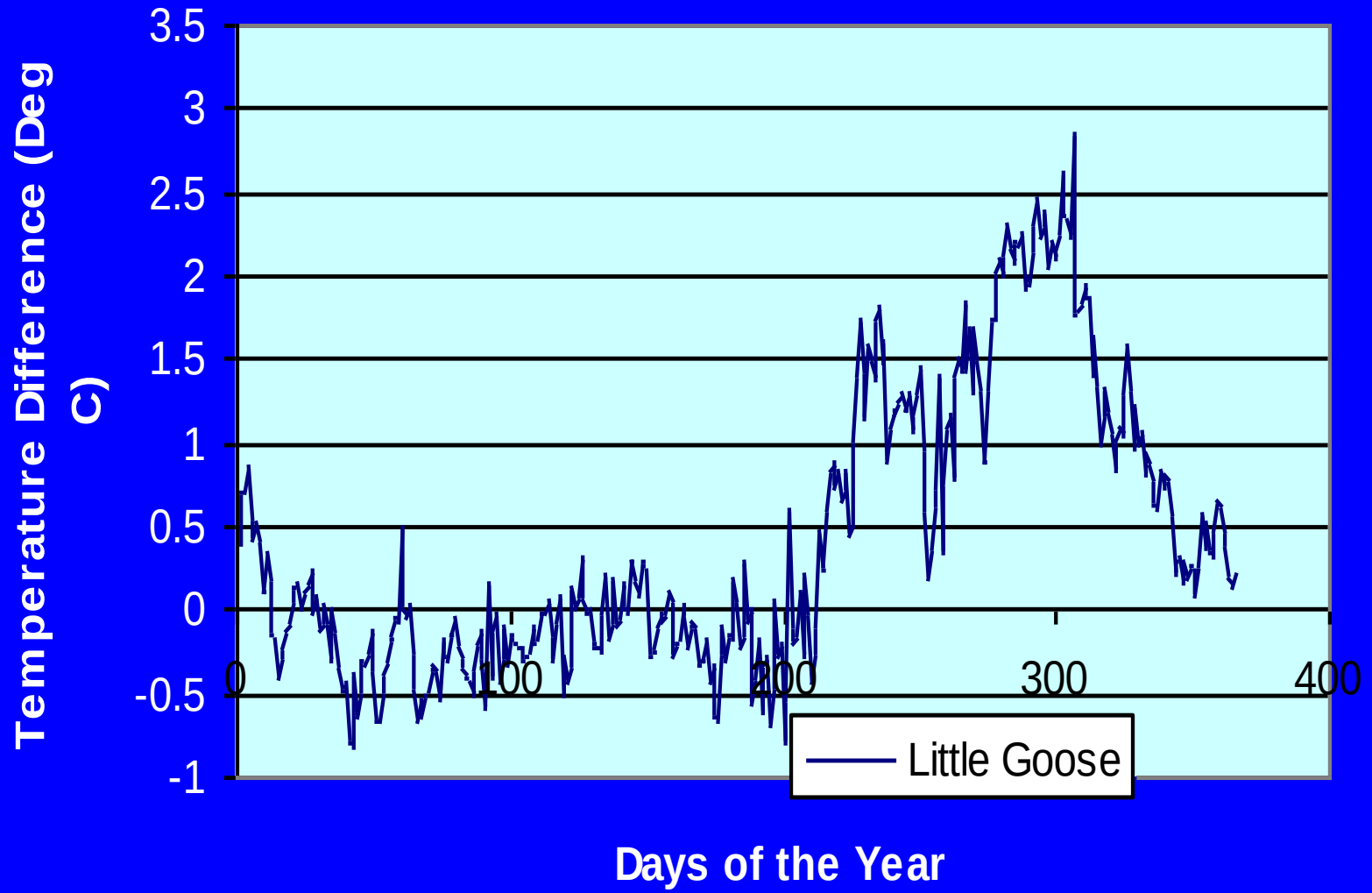
Dams with highly variable impacts from no impact to 1/2 a degree Centigrade:

- Wells
- Rock Island
- McNary
- Bonneville
- Rocky Reach
- Priest Rapids
- The Dalles

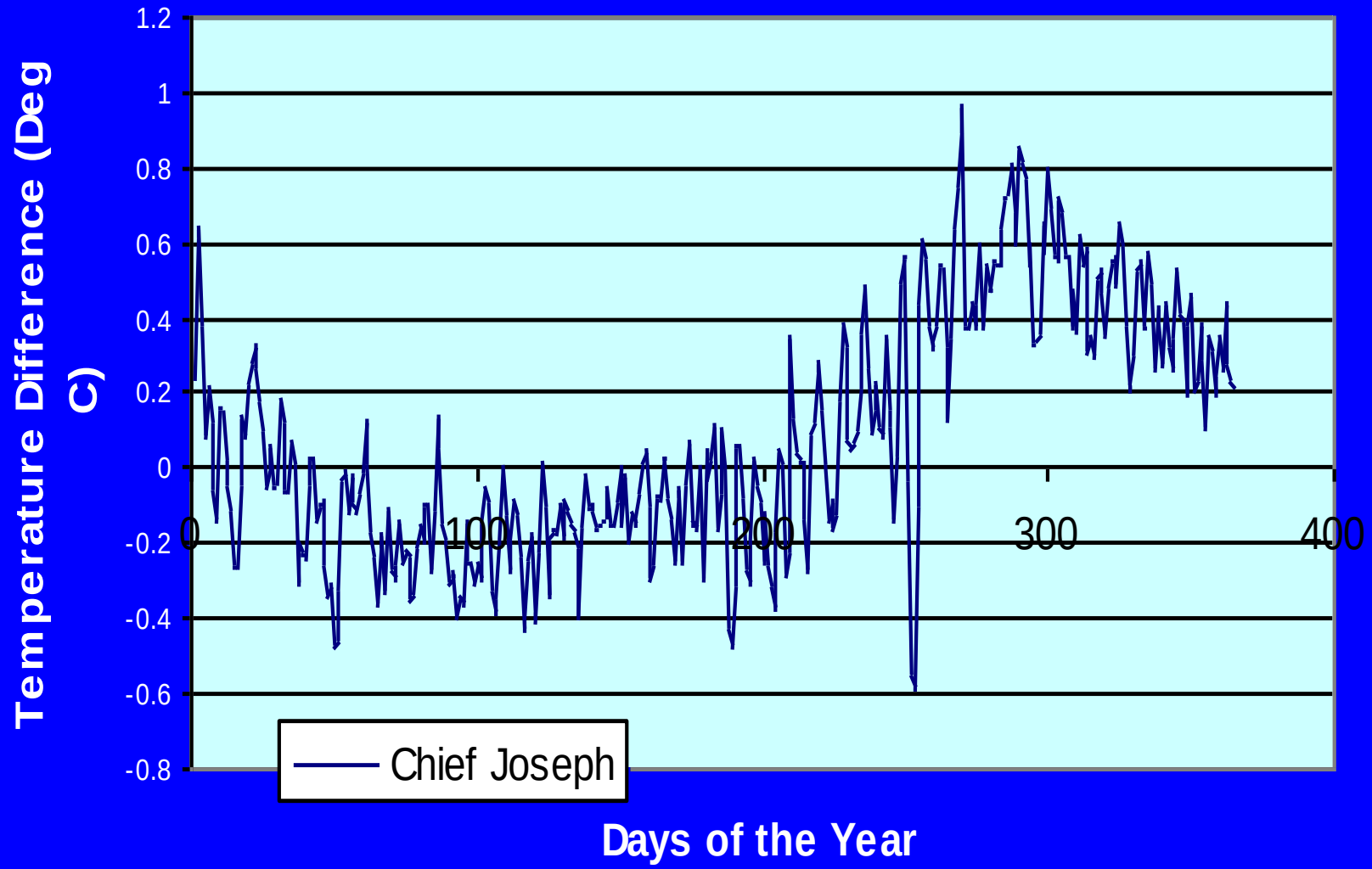
Temperature Difference at Grand Coulee: Existing - Site Potential - 30 Year Mean



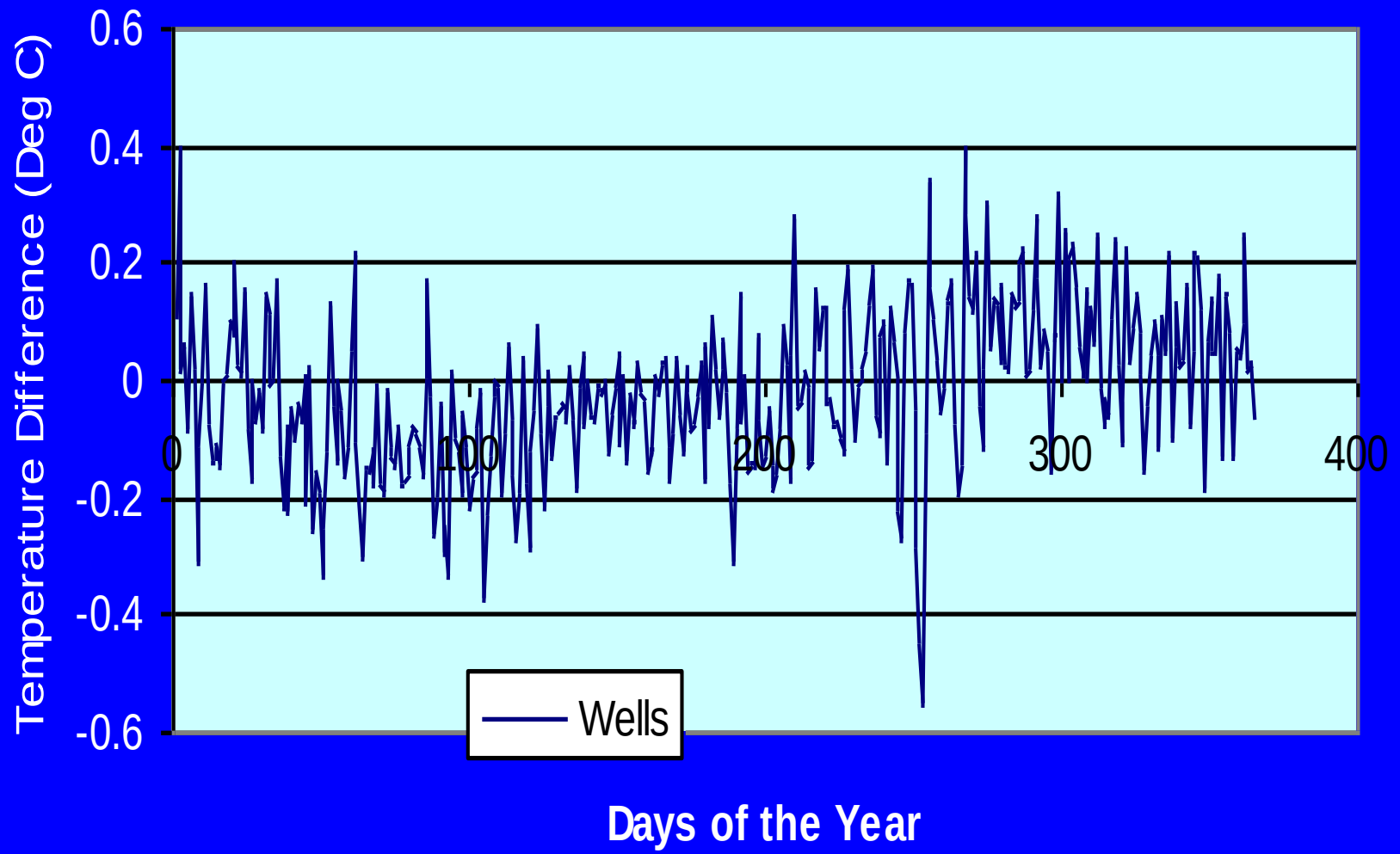
Temperature Difference at Little Goose: Existing - Site Potential : 30 Year Mean



Temperature Difference at Chief Joseph: Existing - Site Potential - 30 Year Mean



Temperature Difference at Wells: Existing - Site Potential : 30 Year Mean



Role of the TMDL

- quantify the temperature problem;
- define the target temperatures;
- determine the level of improvement needed.

Role of the TMDL

- The TMDL establishes the temperature allocations along the river.
- It does not mandate that dams be removed or any other actions taken.
- The TMDL implementation plan will determine if there are feasible measures to achieve the TMDL.

Role of the TMDL

- If there are not feasible measures through operation, maintenance or possible modifications to the dam that will achieve the TMDL, the water quality standards can be amended by the state to reflect the improvement that can be attained.

Role of the TMDL

- The remainder of the impairment resulting from the dam would then be included in the TMDL as background allocation due to the existence of the dam.

Concerns Expressed

- Dams should be included in the TMDL as background;
- TMDL makes federal dam operators vulnerable to law suits;
- TMDL ignores uses of the river other than fish uses;

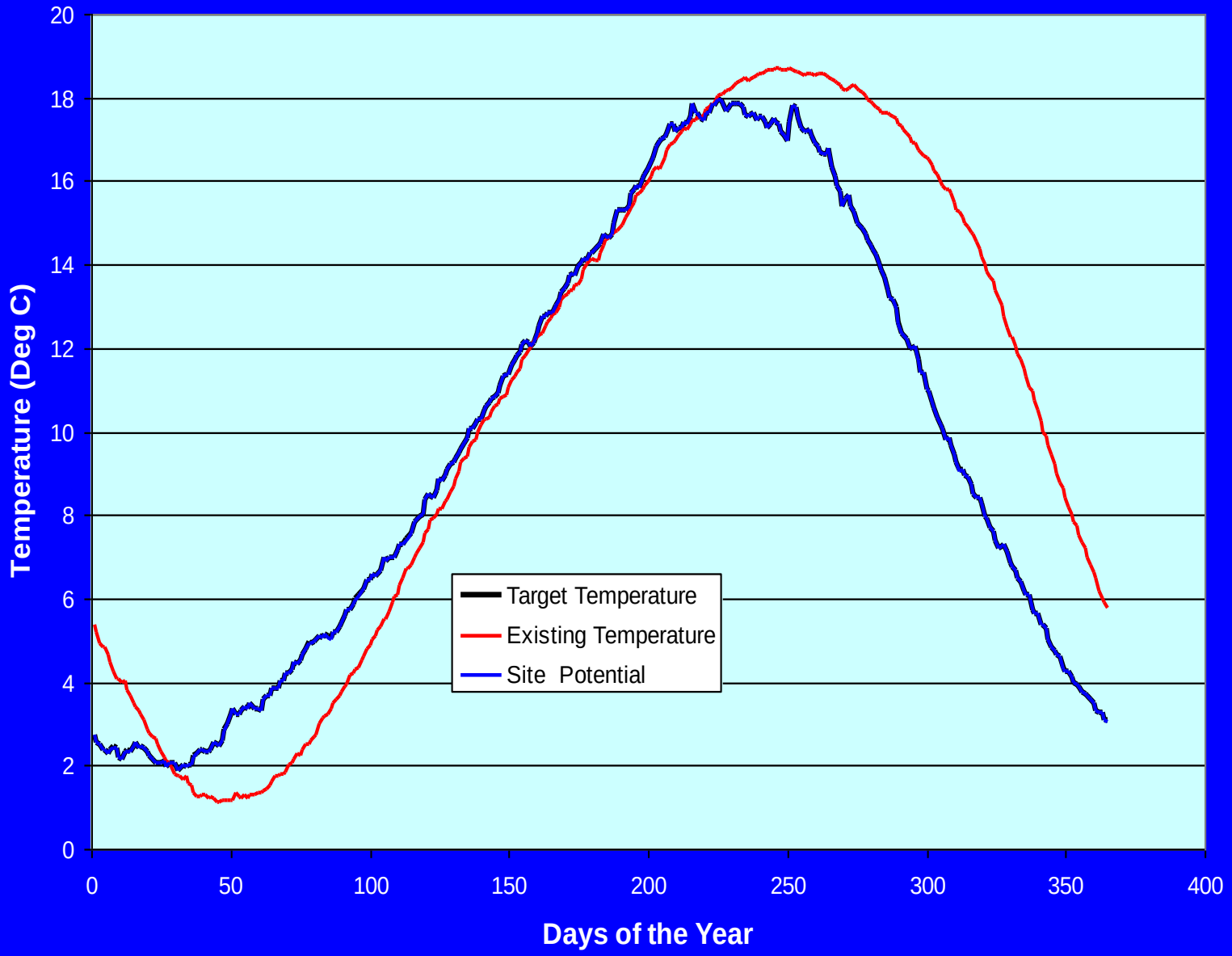
Concerns Expressed

- The Water Quality Standards of the 3 states and 2 tribes with jurisdiction are too complex;
- The Water Quality Standards are extreme and cannot be met.
- The data and modeling are insufficient;

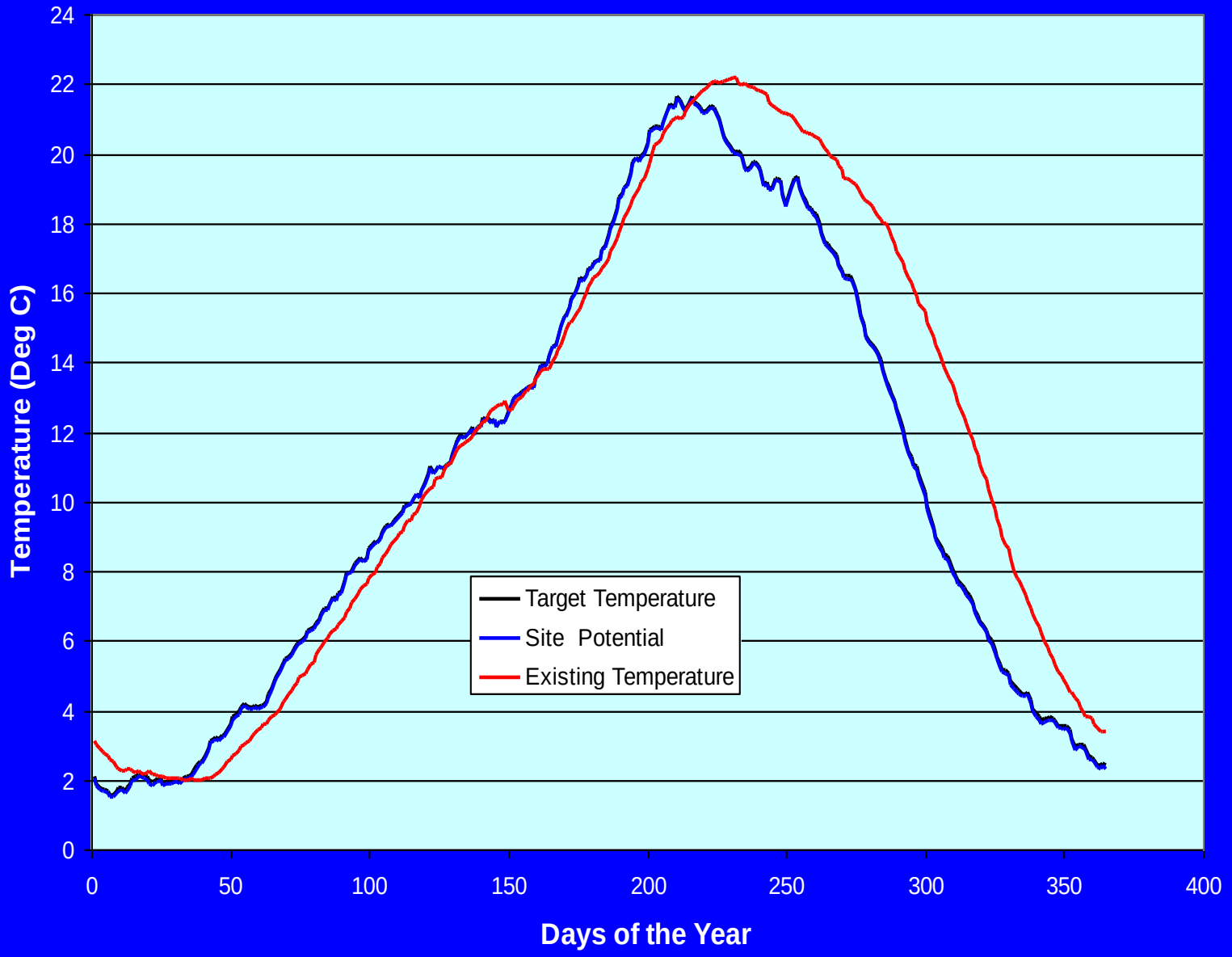
Temperature Improvement

The following slides illustrate the improvement that could be realized if feasible measures can be developed to implement the TMDL.

Simulated Site Potential, TMDL Target and Existing Temperatures at Grand Coulee: 30 Year Means



Simulated Site Potential, TMDL Target and Existing Temperatures at Ice Harbor: 30 Year Means



Simulated Site Potential, TMDL Target and Existing Temperatures at Bonneville: 30 Year Means